ERRATA to
“FOURIER ANALYSIS AND ITS APPLICATIONS”
(4th and later printings by Brooks/Cole and
all printings by the American Mathematical Society)
G. B. Folland
Last updated May 28, 2020

Additional corrections will be gratefully received at folland@math.washington.edu.

Page 13: On the line before (1.20), insert “for $A \neq 0$” after “and”. Immediately after (1.20), insert “For $A = 0$ the solution is $X(x) = C_1 + C_2 x$.”

Page 28, item 14: $\sum_1^\infty \rightarrow \frac{2}{\pi} \sum_1^\infty$

Page 31, bottom: Insert the following material that somehow got deleted: “shall present some variations of this result under other conditions on $f$. We first define the class of functions with which we shall be working.”

Page 33, line −3: $\int_{\pi+\theta}^{\pi+\theta} \rightarrow \int_{\pi+\theta}^{\pi-\theta}$

Page 36, line −4: taking taking → taking

Page 40, line 10: entry 4 → entry 6

Page 44, line 5: extensions → extensions

Page 58, line 2: $\int_{\pi}^{\pi} \rightarrow \frac{1}{2\pi} \int_{-\pi}^{\pi}$

Page 61, Exercise 1a: (2.10) → (2.12)
Page 61, Exercise 1b: (2.12) → (2.14)

Page 65, formula (3.9): $|a_n|^2 \rightarrow \|a_n\|^2$

Page 71, line 7: $\sum_0^\infty$ on the left side should be $\sum_1^\infty$.

Page 76, line 3 of proof of Lemma 3.2: $\sum_m^n \rightarrow \sum_M^N$ (two places, to avoid conflict with use of $n$ as index of summation)

Page 78, line −9 (a 2-line display): $|\tilde{c}_n - c_n|^2 \rightarrow 2\pi|\tilde{c}_n - c_n|^2$ (two places)

Page 79, next-to-last line of text: $f_a^b \rightarrow \int_{-\pi}^{\pi}$

Page 90, last line of Theorem 3.10: $\langle f, \phi_n \rangle \rightarrow \langle f, \phi_n \rangle_w$

Page 90, line −8: $\langle f_1, \tilde{f}_2 \rangle \rightarrow \langle f_1, f_2 \rangle_w$

Page 95, line 4: $f'(a) - \alpha f(a) = f'(b) - \beta f(b) = 0 \rightarrow f'(a) + \alpha f(a) = f'(b) + \beta f(b) = 0$

Page 98, line 1: §4.3 \rightarrow §4.4

Page 100, formula (4.8): When $L$ is 2nd order in $t$ so that $h = (h_1, h_2)$, $u_0$ is really $(u_0, 0)$.

Page 111, line −2: (4.22) → (4.24)

Page 114, Exercise 8a, line 2: (2.24) → (2.27)

Page 117, line −5: $b \rightarrow -b$
Page 152, lines 10, 14, and 15: \( \pi c \to c \) (several places)
Page 152, line 12: 5.3 \( \to 5.2 \)
Page 151, line 5: §4.4 \( \to §4.5 \)
Page 157, Exercise 4: The differential equation should contain the term \( u_{zz} \) (although the requested solutions are independent of \( z \)).
Page 162, line \(-10\): §4.2 \( \to §4.3 \)
Page 163, line 4: \( l/2c \to \pi c/l \)
Page 176, formula (6.21): + \( m^2y \) \( \to \) − \( m^2y \) and \( x \to s \)
Page 179, formula (6.26): \( P_n^{[m]}(\phi) \to P_n^{[m]}(\cos \phi) \)
Page 190, lines \(-8\) and \(-7\): Delete “it defines a polynomial of degree \( n \) only when \( \alpha \) is not a negative integer, and”.
Page 190 line \(-1\): \( k + 1 - \alpha \to k + 1 + \alpha \)
Page 193, line \(-3\): definition \( \to \) definition
Page 197, line \(-12\): \( -n^2y \to +n^2y \)
Page 197, line \(-7\): \( e^{in\theta}z^n \to e^{in\theta}z^n|n| \)
Page 205, line 0: Delete the incorrect page header.
Page 206, line 3 of (v): §8.1 \( \to §8.2 \)
Page 213, Exercise 6: defining \( f_{t+s} \) \( \to \) defining \( f_t \ast f_s \)
Page 214, line \(-2\): \( i(d/d\xi)e^{-i\xi} \to i(d/d\xi)e^{-i\xi}x \)
Page 216, next-to-last displayed formula: \( \text{Res}_{z=i} \to \text{Res}_{z=ia} \)
Page 220, formula (7.18): The \( dy \) is missing from the first integral.
Page 221, line 7: \( \frac{1}{2i} \to -\frac{1}{2i} \)
Page 222, line 1: 2.7 of §2.4 \( \to \) 3.6 of §3.4
Page 224, Exercise 7, line 3: Theorem 2.3 \( \to \) Theorem 2.5
Page 230, line 4: \( 2\pi t \to \pi t \)
Page 233, last displayed formula: \( \Delta_0 \hat{f} \to \Delta_0 \hat{F} \)
Page 235, Exercise 7, last line: \( e^{-i(b-a)t/2} \to e^{-i(a+b)t/2} \)
Page 236, line 2 of Exercise 10: \( f' + cf = 0 \to f'(x) + cx f(x) = 0 \)
Page 239, line \(-5\): \( e^{\varepsilon^2kt} \to e^{-\varepsilon^2kt} \)
Page 242, line \(-1\): \( \lim_{\delta \to 0} \to \lim_{\epsilon \to 0} \)
Page 250, line \(-3\): \( e^{2\pi im} \to e^{2\pi in} \)
Page 250, line \(-2\): \( \hat{a}_n \to \hat{a}_m \)
Page 251, display after (7.40): \( n > k \to n < k \)
Page 252, line \(-5\): \( a_m \to \hat{a}_m \)
Page 259, lin \(-9\): \( f(z) \to f(t) \)
Page 261, line 12: (8.2) → (8.4)
Page 275, line -7: sin(t - s) → sin 2(t - s)
Page 279, formula (8.18): αβ ≠ 0 → (α, β) ≠ (0, 0)
Page 286, Exercise 9c, line 1: period 2l → period 4l/c
Page 327, line -2: 1 - t → 2π - t (2 places in exponents)
Page 328, line 3: 1 - t → 2π - t
Page 333 (starting below formula (9.27)) and page 334: \( \hat{f} \rightarrow \hat{F} \) (numerous places!)
Page 354, Example 1, line 1: complex → nonzero
Page 355, line 4: \( (\alpha \alpha' \neq 0, \beta \beta' \neq 0) \rightarrow ((\alpha, \alpha') \neq (0, 0), (\beta, \beta') \neq (0, 0)) \)
Page 360, second display: \( \tau_2 \rightarrow \tau^2 \)
Page 371, formula (10.32): \( \frac{N}{\mu} \rightarrow -\frac{\beta}{\mu} \) and, in the integral, \( v_a \rightarrow v_b \)
Page 373, last display before Lemma 10.3: \( E_1E_4 \rightarrow \mu^{-1}E_1E_4 \) and \( E_2E_3 \rightarrow \mu^{-1}E_2E_3 \)
Page 375, Figure 10.2: The coordinates of the vertices should be divided by \( b - a \).
Page 375, proof of Theorem 10.4(a): The first seven lines of the argument are flawed because of a confusion between the \( \mu \) of Lemma 10.3 and the \( \mu = \mu^2 \) here. Rather than taking \( \gamma_N \) to be the contour in Figure 10.2, let \( \Gamma_N \) be the right-hand half of that contour (corrected as above) in the \( \mu \)-plane (including endpoints), and let \( \gamma_N \) be the image of \( \Gamma_N \) in the \( \zeta \)-plane under the map \( \zeta = \mu^2 \). Thus \( \gamma_N \) is a closed contour consisting of two parabolic arcs with focus at the origin and vertices at \( \pm \frac{(N + \frac{1}{2})\pi}{(b - a)} \), intersecting at \( \pm 2i[(N + \frac{1}{2})\pi/(b - a)]^2 \). Replace the displays on lines 5 and 7 of the proof by

\[
\left| \frac{G(x, y, \mu^2)}{\mu^2 - \lambda} \frac{2\mu}{2|\mu|} \right| \leq \frac{C|\mu|^{-1}}{|\mu^2 - \lambda|^2} \frac{2|\mu|}{C'} \frac{N^2}{N^2} \quad \text{for } \zeta \text{ on } \Gamma_N,
\]

and

\[
\left| \int_{\gamma_N} \frac{G(x, y, \zeta)}{\zeta - \lambda} \frac{2\mu}{2|\mu|} d\zeta \right| = \left| \int_{\gamma_N} \frac{G(x, y, \mu^2)}{\mu^2 - \lambda} - \frac{2\mu}{2|\mu|} d\mu \right| \leq \frac{C'}{N^2} (\text{length of } \Gamma_N) = \frac{C''}{N},
\]

and then resume the argument in the text starting on line 8.
Page 379, formula (10.35): \( xu(x) \rightarrow xu'(x) \)
Page 381, first line after second displayed formula: \( 1/\mu \sqrt{x-x_+} \rightarrow 1/|\mu| \sqrt{x-x_+} \)
Page 411, line 9: \( \frac{A(LB)^{n-1}}{(n-1)!} \rightarrow \frac{A(LB)^{n-1}}{(n-1)!} |x - x_0|^{n-1} \)
Page 414, Answer to Exercise 3c in §3.1: \( 2 - 9i \rightarrow 2 + 9i \)
Page 415: Answer to Exercise 3 in §3.2 should be \( f_2(x) = x^2 - \frac{1}{3} \).
Page 417, Answer to Exercise 10b in §4.2: \( \pi^2 kt \) (in exponent) → \( \pi^2 k \)
Page 417, Answer to Exercise 10c in §4.2: The sum should be multiplied by \( e^{-kt} \).
Page 420, Answer to Exercise 2 in §6.3: \( P_2^2(\cos \theta) \rightarrow P_2^2(\cos \phi) \)
Page 422, Answer to Exercise 9b in §7.4: \( e^{-\nu b} \rightarrow e^{-\nu \beta} \) (six places)
Page 429, top line, second column: \( T \rightarrow \Gamma \)